



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/800,749      | 03/16/2004  | Takashi Saiki        | 042193              | 1173             |

38834 7590 02/14/2007  
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP  
1250 CONNECTICUT AVENUE, NW  
SUITE 700  
WASHINGTON, DC 20036

|          |
|----------|
| EXAMINER |
|----------|

HOANG, QUOC DINH

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2818

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE  | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS                               | 02/14/2007 | PAPER         |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/800,749

Applicant(s)

SAIKI ET AL.

Examiner

Quoc D. Hoang

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 14-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 14-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. Amendment filed on 11/22/2006 has been entered. Claims 15-24 are newly added. Claims 1-5 and 14-24 are pending in the application.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5, and 14-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (U.S. Pat No. 6,274,906 hereinafter "Kim").

**Regarding claim 1**, Kim teaches a semiconductor device comprising:

a gate (14) formed over a semiconductor region (10) while placing an insulating film (12) in between;

a first impurity-diffused region (22) formed , as being substantially aligned with said gate in the surficial layer of the semiconductor region;

a second impurity-diffused region (24) formed, as being distant from said gate while placing a portion of a side of said first impurity-diffused region in between; and

a third impurity-diffused region (28) formed as being distant from said gate while placing said portion of said side of said first impurity-diffused region and a portion of a side of said second impurity-diffused region in between; wherein the third impurity-diffused region has a higher impurity-concentration than the second impurity-diffused

Art Unit: 2818

region; wherein said second impurity-diffused region is formed as containing a "diffusion suppressive element" . *Noted that the impurity in second region (24) is considered to be the diffusion suppressive element*; wherein said third impurity-diffused region is formed deeper than said second impurity-diffused region (col. 3, lines 10-65 and Fig. 1). Kim teaches the diffusion suppressive element except for "for suppressing diffusion of an impurity contained in said third impurity-diffused region". It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to combine the second impurity-diffused region containing a diffusion suppressive element teaching of Kim with "diffusion suppressive element for suppressing diffusion of an impurity contained in said third impurity-diffused region", since it has been held that the recitation of a new intended use for an old product does not make a claim to that old product patentable, *In re Schreiber* 44 USPQ2d 1429 (Fed. Cir. 1997).

**Regarding claim 15**, Kim teaches a semiconductor device comprising:

a gate (14) formed over a semiconductor region (10) while placing an insulating film (12) in between;

a first impurity-diffused region (22) formed , as being substantially aligned with said gate in the surficial layer of the semiconductor region;

a second impurity-diffused region (24) formed, as being distant from said gate while placing a portion of a side of said first impurity-diffused region in between; and

a third impurity-diffused region (28) formed as being distant from said gate while placing said portion of said side of said first impurity-diffused region and a portion of a side of said second impurity-diffused region in between; wherein the third impurity-

Art Unit: 2818

diffused region has a higher impurity-concentration than the second impurity-diffused region; wherein said second impurity-diffused region is formed as containing a "diffusion suppressive element" . *Noted that the impurity in second region (24) is considered to be the diffusion suppressive element*; wherein said third impurity-diffused region is at least any one element selected from arsenic, germanium, nitrogen, fluorine and carbon for the case where said impurity contained in said first and third impurity-diffused regions is an n-type impurity (col. 3, lines 10-65 and Fig. 1). Kim teaches the diffusion suppressive element except for "for suppressing diffusion of an impurity contained in said third impurity-diffused region". It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to combine the second impurity-diffused region containing a diffusion suppressive element teaching of Kim with "diffusion suppressive element for suppressing diffusion of an impurity contained in said third impurity-diffused region", since it has been held that the recitation of a new intended use for an old product does not make a claim to that old product patentable, *In re Schreiber* 44 USPQ2d 1429 (Fed. Cir. 1997).

**Regarding claim 20**, Kim teaches a semiconductor device comprising:

a gate (14) formed over a semiconductor region (10) while placing an insulating film (12) in between;

a first impurity-diffused region (22) formed , as being substantially aligned with said gate in the surficial layer of the semiconductor region;

a second impurity-diffused region (24) formed, as being distant from said gate while placing a portion of a side of said first impurity-diffused region in between; and

a third impurity-diffused region (28) formed as being distant from said gate while placing said portion of said side of said first impurity-diffused region and a portion of a side of said second impurity-diffused region in between; wherein the third impurity-diffused region has a higher impurity-concentration than the second impurity-diffused region; wherein said second impurity-diffused region is formed as containing a "diffusion suppressive element" . *Noted that the impurity in second region (24) is considered to be the diffusion suppressive element*; wherein said third impurity-diffused region is at least any one element selected from germanium, nitrogen, fluorine and carbon and indium for the case where said impurity contained in said first and third impurity-diffused regions is an n-type impurity (col. 3, lines 10-65, col. 6, lines 1-6 and Fig. 1). Kim teaches the diffusion suppressive element except for "for suppressing diffusion of an impurity contained in said third impurity-diffused region". It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to combine the second impurity-diffused region containing a diffusion suppressive element teaching of Kim with "diffusion suppressive element for suppressing diffusion of an impurity contained in said third impurity-diffused region", since it has been held that the recitation of a new intended use for an old product does not make a claim to that old product patentable, *In re Schreiber* 44 USPQ2d 1429 (Fed. Cir. 1997).

**Regarding claims 2, 16 and 21**, Kim teaches further comprising:

a first sidewall spacer (18) formed over both lateral faces of said gate; and  
a second sidewall spacer (20) formed to cover said first sidewall spacer over both lateral sides of said gate; wherein said second impurity-diffused region is formed

as being aligned with said first sidewall spacer, and said third impurity-diffused region is formed as being aligned with said second sidewall spacer (col. 3, lines 10-65 and Fig. 1).

**Regarding claims 3, 17 and 22**, Kim teaches the fourth impurity-diffused region (26) containing an impurity having a conductivity type (p-type) opposite to that of impurities contained in said first impurity-diffused region (n-type) (22) and third impurity-diffused region (n-type) (28) (col. 3, lines 10-45 and Fig. 1).

**Regarding claims 4, and 23**, Kim teaches wherein said diffusion suppressive element is at least any one element selected from arsenic, germanium, nitrogen, fluorine and carbon for the case where said impurity contained in said first and third impurity-diffused regions is an n-type impurity (col. 3, line 10 through col. 4, line 52 and Fig. 1).

**Regarding claims 5, and 18**, Kim teaches wherein said diffusion suppressive element is at least any one element selected from germanium, nitrogen, fluorine, carbon and indium for the case where said impurity contained in said first and third impurity-diffused regions is a p-type impurity (col. 6, lines 1-6).

**Regarding claims 14, 19 and 24**, Kim teaches wherein the third impurity-diffused region has a higher impurity-concentration than the first impurity-diffused region (col. 4, lines 21-30 and col. 5, lines 30-40).

#### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 2818

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone numbers of the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.



Art Unit: 2818

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Quoc Hoang  
Patent examiner/AU 2818

  
6/21/08/2008

**QUOC D. HOANG**  
**PRIMARY PATENT EXAMINER**